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Sustainable Project Management Practices and Environment Performance of Housing Construction Projects in Nairobi City County, Kenya

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Abstract:

Purpose: *The primary objective of this study was to assess the influence of sustainable project management practices on the environmental performance of housing construction projects in Nairobi City County, Kenya.*

Material/methods: *The study was anchored on Stakeholder Theory and Legitimacy Theory and employed a descriptive survey research design. The target population consisted of project managers or supervisors involved in 71 housing construction projects within the county. A census approach was adopted. Primary data were collected using structured questionnaires. Content validity was evaluated using the Content Validity Index (CVI), while reliability was measured using Cronbach's alpha coefficient. Data were analyzed using both descriptive and inferential statistical techniques.*

Findings: *The results revealed that social responsibility practices had a significant positive impact on the environmental performance of housing projects. Additionally, sustainability-oriented resource management was identified as an important factor, although its influence was somewhat less pronounced compared to social responsibility.*

Conclusion*: The study concludes that the integration of sustainable project management practices—particularly those promoting social responsibility—plays a key role in enhancing environmental outcomes in the construction sector.*

Value: *This research provides empirical insights into how sustainability practices can be leveraged to improve environmental performance in urban housing projects. The findings offer practical recommendations for stakeholders in the construction industry to strengthen social responsibility and adopt resource-efficient strategies to advance environmental sustainability in project execution.*

Keywords*: Sustainable Project Management Practices, Environment Performance, Housing Construction Projects, Social Responsibility, Sustainability-Oriented Resource Management*

Paper Type: *Research Article*

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1.1. Introduction

In the contemporary project management landscape, the integration of sustainability has emerged as a pivotal concern, reflecting a paradigm shift towards more responsible and long-term oriented practices. This shift is driven by the increasing recognition of the environmental, social, and economic impacts of projects, necessitating a holistic approach that balances these dimensions for the benefit of current and future generations (Molaei et al., 2020). In sub-Saharan Africa, buildings contribute over 50% of the region's energy consumption, underscoring the construction sector's critical role in mitigating GHG emissions and managing resource depletion (Ametepey et al., 2023). This scenario highlights the potential of the construction industry to devise strategies to confront the challenges posed by global climate change, resulting in numerous benefits, including decreased air pollution, lower mortality rates linked to climate change, enhanced energy security, and improved social well-being. However, concerns regarding methane emissions during production and transportation, habitat disruption due to infrastructure development, and water consumption during liquefaction have sparked calls for implementing more sustainable practices within the industry (Fu, 2021). Consequently, there is an increasing acknowledgement of the necessity to incorporate sustainability principles into project management to reduce environmental impacts, address societal concerns, and ensure long-term viability.

Current research will concentrate on assessing the environmental performance of construction projects through the lens of sustainable project management practices. Both project management and sustainability have emerged as critical issues among managers today (Armenia et al., 2019). Sustainable project management entails the systematic integration of environmental, social, and economic considerations at all stages of project planning, implementation, and evaluation (Stanitsas et al., 2021). This holistic approach aims to balance the interests of diverse stakeholders while reducing negative impacts on the environment and society. The goal of sustainable project management is to create value not solely in terms of financial gains, but also concerning social equity, environmental stewardship, and long-term sustainability (Khatib et al., 2020). Furthermore, the interconnection between project success and sustainable development has become a significant focus of research. Moreno-Monsalve et al. (2022) demonstrate that projects that align with sustainable development principles tend to create greater value, indicating the strategic benefits of integrating sustainability into project management, ultimately enhancing overall project success and impact.

There is a growing emphasis on developing innovative managerial practices for project management (PM), with principles of sustainability permeating all facets of business and organizational management. The convergence of these two fields represents the future direction for project-based organizations. Sustainable project management integrates sustainability principles throughout the planning, execution, and evaluation phases of projects, aiming to achieve positive economic, social, and environmental outcomes while fulfilling project objectives and meeting stakeholder expectations (El Khatib et al., 2020). The five key dimensions of sustainable project management identified through analysis include corporate policies and practices, sustainability-oriented resource management, life cycle orientation, stakeholder engagement, and organizational learning (Chawla et al., 2018; Armenia et al., 2019). These principles provide a framework that facilitates the integration of environmental, social, and economic considerations into project planning and execution (Larsson and Larsson,

2020). They emphasize a holistic approach that seeks to minimize negative impacts while maximizing positive results for all stakeholders. Essential principles involve stakeholder engagement, lifecycle thinking, resource efficiency, and continuous improvement. By embedding sustainability principles into project management processes, organizations can bolster project resilience, mitigate risks, and create long-term value for society and the environment (Settembre et al., 2021). (Settembre et al., 2021).

Improving environmental performance in construction is vital for sustainable development and occupant well-being (Gan et al., 2015), yet uptake in Kenya remains low—with only about 32.9% of projects applying green concepts and just 7% achieving certification (Kanda et al., 2023; Maeda et al., 2023). Although sustainable project management could halve energy use and cut greenhouse gas emissions by 80% by 2050, in line with Vision 2030 (Mulei, 2021), barriers such as high technology costs, weak legal frameworks, and poor waste disposal hinder progress (Owuor et al., 2023; Sila & Gakobo, 2021). In Nairobi, nearly half of construction projects are unfinished and over 58% of buildings are deemed unfit for habitation (Ministry of Housing, Land and Urban Development, 2021; Oiriga & Ngari, 2019), while catastrophic collapses—such as the 2016 Huruma and 2019 Tassia incidents—underscore the human and economic toll of neglecting green and safety standards (Bucha, Onyango, & Okello, 2020). Although local studies have explored green building adoption in specific areas (Kanda et al., 2023; Mulei, 2021; Owuor et al., 2023), none have examined how sustainable project management practices influence environmental performance in housing projects across Nairobi City County (Lima et al., 2023). Therefore, this study addressed that gap. The general objective of the study was to determine the influence of sustainable project management practices on environment performance of housing construction projects in Nairobi City County.

1.2. Theoretical literature review

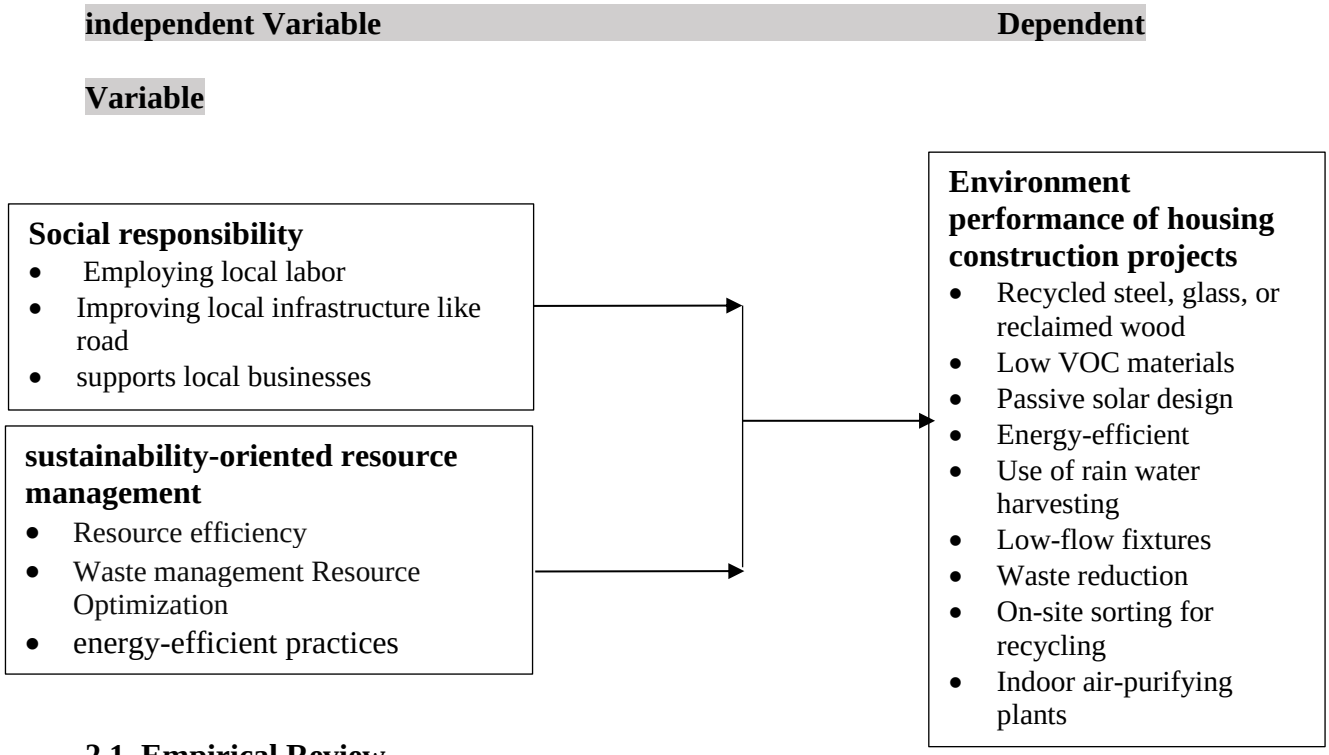
Stakeholder theory, first articulated by Freeman (1984), holds that organizations must recognize and engage all groups or individuals—beyond just shareholders—whose actions affect or are affected by the organization's objectives. In construction projects, this means actively involving local communities, environmental groups, regulators, and other parties throughout planning and execution. Recent studies (Kivell et al., 2020; Liao et al., 2021) show that such engagement not only fosters collaboration and improves communication but also strategically aligns project goals with environmental concerns, turning stakeholder involvement into a competitive advantage rather than merely an ethical duty. By embedding diverse perspectives into decision-making, project managers can preempt conflicts, leverage stakeholder support, and implement sustainable practices that drive better environmental outcomes in Nairobi's housing projects.

Legitimacy theory, developed by Dowling and Pfeffer (1975) and expanded by Suchman (1995), asserts that organizations gain social approval—and thus operational success—by conforming to societal norms and expectations. In the construction sector, demonstrating commitment to social responsibility through ethical behavior, transparent communication, community engagement, and eco-friendly practices enhances a firm's legitimacy and builds stakeholder trust. Empirical evidence (Lacy et al., 2020; Parsa et al., 2021) indicates that firms perceived as legitimate face fewer implementation hurdles, enjoy greater community acceptance, and achieve superior

environmental performance. Framing social responsibility initiatives as legitimacy-building strategies thus provides a robust framework for understanding how construction firms can both meet stakeholder expectations and advance sustainability goals.

1.3. Conceptual Framework

The conceptual framework (fig 1) constitutes independent variables (social responsibility and sustainability-oriented resource management), dependent variable; environment performance of housing construction projects.



2.1. Empirical Review

2.1.1. Social Responsibility and Environment Performance of Housing Construction Projects

Ajibike et al. (2023) explored the effects of social responsibility on the environmental sustainability performance of construction firms in Malaysia. Through a cross-sectional survey involving 185 questionnaires distributed among G7 construction firms, the researchers utilized PLS path modeling to analyze the data. The findings indicated that both social responsibility and coercive pressure positively influence environmental sustainability performance. Despite the inherently charitable nature of social responsibility, construction firms are compelled to invest in social responsibility activities to maintain legitimacy and comply with regulatory frameworks. Furthermore, the study highlighted that coercive pressure enhances the positive effects of social responsibility on environmental sustainability performance, illustrating that firms acknowledge the importance of aligning their practices with stakeholder expectations.

In a related investigation, Dominguez Herrera et al. (2023) analyzed the socially responsible behaviors of construction companies in Santa Cruz de Tenerife, utilizing 99 indicators segmented into three categories: environmental, social, and economic. The aim was to assess how these companies prioritize their social responsibility

initiatives. The results showed that environmental sensitivity and social contributions are pivotal factors in adopting corporate social responsibility (CSR) strategies, while economic considerations negatively impact these efforts. For companies planning to implement CSR strategies in the future, the emphasis on social contribution emerged as a key influence, reinforcing the critical role of social responsibility in advancing environmental performance.

Wentzel et al. (2023) developed a corporate social responsibility (CSR) model tailored for guiding small and medium-sized enterprises (SMEs) within the South African construction industry (SACI) toward achieving sustainable business performance (SBP). By validating their theoretical CSR model with Partial Least Squares Structural Equation Modeling (PLS-SEM) through data collected from 110 SMEs listed with the Construction Industry Development Board (cidb), the researchers found that CSR drivers and the challenges SMEs encounter in implementing CSR significantly affect their perceptions of the relationship between CSR integration and sustainable business performance. The study suggests that a comprehensive application of the PLS-SEM CSR model allows SMEs in the SACI to enhance their SBP, highlighting the direct contribution of effective CSR practices to improved environmental performance.

Al-Marri and Pinnington (2022) investigated how corporate social responsibility (CSR) initiatives and sustainable development projects can enhance awareness and engagement in the United Arab Emirates (UAE). Utilizing qualitative case study methods, they analyzed a UN-supported annual youth engagement program focused on the implementation of sustainable development initiatives. The study revealed that the complexity and systematic approach to sustainability activities in the UAE reflect a more advanced stage of CSR and sustainable development efforts than what is typically reported in the literature. By applying project management principles to organize, implement, and monitor sustainability-centered programs, the research emphasizes the collaborative role of both corporate and governmental stakeholders. This study showcases the significance of strategic management in facilitating effective sustainability practices and underscores how CSR initiatives contribute to enhancing environmental performance in construction projects.

2.1.2. Sustainability-oriented resource management and Environment Performance of Housing Construction Projects

Research by Kumar et al. (2022) highlights that organizations implementing sustainability-oriented resource management practices, such as efficient resource utilization and waste minimization, experience improved sustainability outcomes in their projects. The study utilized a mixed-methods approach involving surveys and case studies from the construction industry, revealing that firms adopting green procurement practices not only reduce environmental impact but also enhance project sustainability by lowering operational costs**.**

A quantitative analysis by Li and Zhang (2023) examined the relationship between resource efficiency measures and project sustainability in the manufacturing sector. By surveying over 300 production managers, the study found that organizations that emphasize resource efficiency—such as energy and material conservation—significantly enhance the environmental and social sustainability of their projects. Results indicated that increased resource efficiency not only minimizes waste but also contributes to better community relations and employee satisfaction.

antos and Leitner (2020) developed a conceptual framework for sustainability-oriented resource management based on empirical data from public infrastructure projects. Their research emphasized the importance of aligning sustainability-oriented resource management practices with sustainability goals, identifying key factors such as regulatory compliance, community engagement, and sustainability metrics that drive project success. The framework was validated through case studies, demonstrating that adherence to sustainability-oriented resource management principles leads to improved project outcomes and long-term viability

Research by Norris and Williams (2023) explored the application of circular economy principles within sustainability-oriented resource management. The study, which utilized case studies from the construction and manufacturing sectors, found that organizations adopting circular economy practices, such as reusing materials and closed-loop systems, achieved greater sustainability in their projects. The findings suggest that implementing circular sustainability-oriented resource management not only reduces environmental impact but also creates economic opportunities through innovative business models.

3.1. Methodology

The study adopts a descriptive survey research design to examine how sustainable project management practices influence the environmental performance of housing construction projects in Nairobi City County. It targets all 71 housing projects—represented by project managers, supervisors, and middle-level employees—using a census approach to ensure comprehensive coverage and eliminate sampling error. Data are collected via a structured questionnaire aligned with the research objectives and employing a five-point Likert scale to capture nuanced stakeholder perceptions. Prior to the main study, a pilot test involving nine respondents (5% of the population) is conducted to refine the instrument and ensure clarity; its reliability is confirmed through Cronbach's alpha analysis ($\alpha > 0.7$), and its validity is established via expert review and component factor analysis, with items below a 0.4 loading removed. Field data collection follows a drop-and-pick procedure, supported by an introductory letter from JKUAT and permission from the County's Department of Built Environment and Urban Planning to bolster participation. Once collected, responses are coded in Excel and analyzed in SPSS: descriptive statistics guide model specification, a correlation matrix checks for multicollinearity, and multiple regression analysis is performed to determine the influence of the independent variables on environmental performance. The regression model is represented below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

Where,
$Y =$ Environment performance of housing construction projects, β_0 =Constant
$X_2 =$ Social responsibility, $X_3 =$ Sustainability-oriented resource management

4.1. Findings And Discussion

This section presents the findings and results of the use of variables using procedures mentioned in chapter three of the methodology. In line with specific objectives, data was analyzed, interpreted, and inferences drawn on them. The main aim of the study was the determination of the influence of sustainable project management practices on

environment performance of housing construction projects. the study targeted a total of 71 project managers or supervisors involved in housing construction projects within Nairobi City County. Out of these, 62 questionnaires were accurately completed and returned, resulting in a high response rate of 86.11%. According to Mugenda and Mugenda (2013), a response rate of 70% and above is considered very good, while Cooper and Schindler (2014) note that a response rate above 60% is sufficient for meaningful statistical analysis. Therefore, the achieved response rate not only meets but exceeds these established thresholds. This high level of participation enhances the credibility, reliability, and generalizability of the research findings and affirms that the data collected is adequately representative of the target population in Nairobi City County.

4.1.1. Demographic Information

This section outlines the demographic characteristics of the respondents who participated in the study examining the influence of sustainable project management practices on environmental performance of housing construction projects in Nairobi City County.

Table 1: *Demographic Respondents*

		Frequency	Percent
gender	Male	40	65
	Female	22	35
	Total	62	100
Educational level	Secondary School	2	3.2
	Diploma	19	30.6
	Undergraduate Degree	27	43.5
	Postgraduate Degree	14	22.6
	Total	62	100
How many years have you worked in the project	1 - 5 years	10	16.1
	6 - 10 years	15	24.2
	11 - 15 years	21	33.9
	16 years and above	16	25.8
	Total	62	100
Employees working in the project	1-50	43	69.4
	51-100	12	19.4
	Above 100 years	7	11.3
	Total	62	100

As shown in Table 1, the majority of respondents (65%) were male, while female respondents accounted for 35%. This gender distribution aligns with the traditionally male-dominated nature of the construction industry, particularly in technical and supervisory roles. In terms of education, a substantial portion of the respondents were well-educated, with 43.5% holding undergraduate degrees and 22.6% having postgraduate qualifications. This suggests that the respondents had adequate academic

preparation to understand and implement sustainable project management practices in their respective construction projects. Regarding work experience, the largest group (33.9%) had been involved in projects for 11–15 years, followed by 25.8% with over 16 years of experience. This implies that most respondents had significant industry exposure, which likely enhances the quality of their insights into how sustainable practices influence environmental outcomes. Additionally, 69.4% of the respondents indicated that their projects had 1–50 employees, suggesting that most of the housing construction projects were small to medium in size. This size may affect how resources are managed, the adoption of sustainable practices, and the ability to monitor environmental performance effectively.

4.1.1.1. Descriptive Statistics for Environment performance of housing construction projects

Respondents indicated strong uptake of indoor air-purifying plants (M = 3.98, SD = 0.91) and broad adoption of energy-efficient technologies (M = 3.77, SD = 1.06) and passive solar design (M = 3.76, SD = 1.52), reflecting growing attention to indoor quality and modern energy strategies; low-VOC materials also showed positive uptake (M = 3.61, SD = 1.36). In contrast, recycled materials (M = 2.71), on-site waste sorting (M = 2.73), and rainwater harvesting (M ≈ 2.74–3.55) scored noticeably lower and with higher variability, suggesting uneven implementation likely driven by technical, financial, or regulatory constraints. The overall environmental-practice mean of 3.15 (SD = 0.91) points to a moderately positive but inconsistent level of sustainability measures across projects, highlighting the need to better standardize and expand green practices.

Table 2: *Descriptive Statistics for Environment performance of housing construction projects*

	Mean	**Std. Dev**
The construction project has effectively incorporated recycled steel, glass, or reclaimed wood in its design.	2.71	1.34
The project has used of low Volatile Organic Compounds (VOC) materials in construction.	3.61	1.36
The project has effectively incorporated passive solar design principles to maximize natural lighting.	3.76	1.52
The project has employed energy-efficient construction methods and technologies.	3.77	1.06
The project effectively incorporates rainwater harvesting systems for water conservation	3.55	1.46
The project effectively incorporates passive solar design principles to maximize natural lighting.	2.68	1.27
The project effectively incorporates rainwater harvesting systems for water conservation	2.74	1.30
The project has established on-site sorting protocols for recycling construction materials.	2.73	1.06
The project incorporates indoor air-purifying plants as part of its design.	3.98	0.91
Procurement performance	**3.95**	**0.88**

4.1.1.2. Descriptive Statistics for Social responsibility

Table 3 presents the descriptive statistics summarizing employee responses regarding the extent to which these social responsibility practices are implemented. As shown in Table 2 Respondents indicated that TVET projects strongly emphasize community employment—recruiting local residents scored highest (M = 4.23, SD = 1.25; 71% strongly agreed)—and infrastructure improvements were also viewed positively (M = 3.65, SD = 1.13; 67.8% agree/strongly agree). Community consultation on infrastructure needs and prioritizing local labor received moderate support (M = 3.52, SD = 1.52; M = 3.55, respectively), though variability suggests inconsistent application. In contrast, engaging local businesses in procurement lagged behind: only 22.6% agreed that suppliers are prioritized (M = 3.00, SD = 1.42), and half of respondents remained neutral (M = 3.18, SD = 1.08), indicating a gap in supplier inclusion. The overall social responsibility mean of 2.71 (SD = 0.86) points to moderate implementation, with strong performance in labor and infrastructure but clear room for improvement in local sourcing practices.

Table 3: *Descriptive Statistics for Social responsibility*

	Mean	**Std. Dev**
The project prioritizes the employment of local labor to support the community.	3.55	1.42
The project actively recruits local residents for job opportunities.	4.23	1.25
The project has contributed to the improvement of local infrastructure, such as roads and utilities.	3.65	1.13
Community members are consulted regarding infrastructure needs before developing improvements through the project.	3.52	1.52
The project actively engages with local businesses to source materials and services.	3.18	1.08
Local businesses are given priority in procurement decisions made for the project.	3.00	1.42
Social responsibility	**2.71**	**0.86**

4.1.1.3. Descriptive Statistics for Sustainability-oriented resource management

Table 4 presents the descriptive statistics reflecting employees' perceptions regarding these sustainability practices within the housing project under review. Overall, respondents perceive sustainability-oriented resource management in housing projects as only moderately implemented (M = 2.69, SD = 0.81), with stronger emphasis on improving efficiency—resource-efficiency practices (M = 3.34, SD = 1.49) and regular efficiency assessments (M = 3.32, SD = 1.46)—than on more advanced sustainability measures. Waste management protocols and recycling initiatives garnered middling support (M = 2.94, SD = 1.41; M = 3.03, SD = 1.33, respectively), suggesting these practices lack consistency and visibility. Meanwhile, lifecycle resource optimization (M = 2.44, SD = 1.21) and routine reviews of resource allocation (M = 2.66, SD = 1.38) scored lowest, indicating limited integration of long-term planning and strategic resource oversight. These findings point to a need for projects to bolster waste-reduction efforts, embed lifecycle sustainability principles, and institutionalize ongoing resource reviews.

Table 4: *Descriptive Statistics for Sustainability-oriented resource management*

	Mean	Std. Dev
The project implements practices aimed at improving resource efficiency in its operations.	3.34	1.49
Regular assessments are conducted to identify opportunities for enhancing resource efficiency.	3.32	1.46
The project has established waste management protocols that effectively reduce waste generation.	2.94	1.41
Recycling and composting programs are actively promoted within the project to minimize waste.	3.03	1.33
The project conducts regular evaluations of its waste management practices to identify areas for improvement.	2.92	1.21
The project employs strategies to optimize the use of resources throughout its lifecycle.	2.44	1.21
Resource allocation is regularly reviewed to ensure maximum efficiency and effectiveness.	2.66	1.38
Sustainability-oriented resource management	**2.69**	**0.81**

4.1.2. Correlation Analysis

The correlation analysis presented in Table 5 examines the relationships between environmental performance (EP) in affordable housing projects in Nairobi County. Social responsibility (SR) also has a substantial positive relationship with environmental performance ($r = 0.665$, $p < 0.01$). This suggests that the project's efforts to manage resources responsibly, such as minimizing waste and ensuring environmental fairness, play a crucial role in improving environmental outcomes. Sustainability-oriented resource management is positively correlated with environmental performance ($r = 0.672$, $p < 0.01$), further emphasizing that efficient management of resources throughout the lifecycle of the housing project supports sustainable environmental practices, which directly enhances the project's overall environmental performance.

Table 5: *Correlation Analysis*

		EP	SR	SORM
Environment performance (EP)	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	62		
Social responsibility (SR)	Pearson Correlation	.665**	1	
	Sig. (2-tailed)	0.000		
	N	62	62	
Sustainability-oriented resource management (SORM)	Pearson Correlation	.672**	.598**	1
	Sig. (2-tailed)	0.000	0.000	
	N	62	62	62

** Correlation is significant at the 0.01 level (2-tailed).

4.1.3. Regression Analysis

The regression analysis includes three main components: Model Summary, ANOVA, and Coefficient Estimates, each of which provides critical insights into the model's effectiveness and the significance of individual predictors. The following interpretation is based on the findings in Table 5 Table 6, and Table 7.

Table 5: *Model Summary Statistics*

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.921a	0.847	0.837	0.36788

a Predictors: (Constant), sustainability-oriented resource management, social responsibility,

The model summary in Table 5 shows that the R Square value suggests that approximately 84.7% of the variation in environmental performance of affordable housing projects in Nairobi County can be explained by the staff sustainability-oriented resource management, social responsibility (R^2=0.847). This is a significant proportion, indicating that the model captures the majority of the factors influencing environmental performance. The Adjusted R Square accounts for the number of predictors used in the model, offering a more accurate measure of the model fit. The small difference between R Square and Adjusted R Square (0.847 vs. 0.837) implies that the number of predictors is optimal, and no unnecessary variables are included.

To evaluate the overall fit of the regression model, an ANOVA test was conducted. This test assesses whether the combination of independent variables significantly explains the variation in the dependent variable, which in this case is the environmental performance of housing construction projects in Nairobi County. The results from the ANOVA test are summarized in Table 6 below.

Table 6: *ANOVA for goodness of fit*

Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	42.813	4	10.703	79.086	.000
	Residual	7.714	57	0.135		
	Total	50.527	61			

a Dependent Variable: environment performance of affordable housing construction projects in Nairobi County
b Predictors: (Constant), Sustainability-oriented resource management, social responsibility

The ANOVA results confirm that the regression model is statistically significant ($F(4, 57) = 79.086$, $p < 0.001$), meaning the combination of Sustainability-oriented resource management, and social responsibility significantly influences the environmental performance of housing construction projects in Nairobi County. The high F-statistic

and low p-value provide strong evidence that the model is a good fit for the data and justifies the use of these sustainable project management practices as predictors of procurement performance in the county government context.

The regression analysis presented in Table 7 offers insightful findings regarding the impact of two key sustainability project management practices social responsibility and sustainability-oriented resource management—on the environmental performance of housing construction projects in Nairobi County. The results are pivotal in understanding the role these practices play in enhancing the sustainability and success of construction project.

Table 7: *Coefficient of Estimates*

	Unstandardized Coefficients		**Standardized Coefficients**		
	B	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	-0.524	0.223		-2.355	0.022
Social responsibility	0.376	0.091	0.315	4.117	0.000
Sustainability-oriented resource management	0.227	0.094	0.207	2.407	0.019

a Dependent Variable: environment performance of housing construction projects in Nairobi County

The first objective of the study was to examine the effect of Social responsibility on the environmental performance of housing construction projects. The analysis revealed a significant positive effect ($\beta = 0.376$, $p = 0.000$), suggesting that incorporating social responsibility into project practices enhances environmental performance. Social responsibility in the construction context often involves addressing environmental concerns through responsible business practices, such as community engagement, reducing ecological footprints, and investing in the welfare of the community. This finding aligns with research by Ajibike et al. (2023), which indicated that CSR practices, such as environmental sensitivity and social contributions, positively influence environmental sustainability performance. Further supporting this, Dominguez Herrera et al. (2023) noted that environmental sensitivity and social contributions are key drivers of CSR strategies. Their research showed that projects focused on both environmental protection and social good tend to perform better in terms of sustainability. The results of this study underscore the importance of integrating CSR into project management strategies, particularly when it comes to making long-term contributions to the environment and surrounding communities. Moreover, the findings suggest that Social responsibility practices, such as ethical decision-making, transparency, and engagement with local communities, significantly affect how construction projects are managed with regard to sustainability. This relationship underscores the growing importance of companies being accountable for their environmental impact and fulfilling their role in the broader community.

The second objective of the study was to assess the impact of Sustainability-oriented resource management on environmental performance. The results showed that SORM

had a positive and statistically significant effect ($\beta = 0.227$, $p = 0.019$) on environmental performance, indicating that resource management practices aimed at sustainability contribute to improved project outcomes. Sustainability-oriented resource management encompasses practices such as optimizing resource use, minimizing waste, and reducing the environmental footprint of construction activities. This can involve the use of green materials, recycling, and energy-efficient technologies. These findings are consistent with previous research by Antos and Leitner (2020), who emphasized the importance of aligning resource management practices with sustainability goals, and Norris and Williams (2023), who found that circular resource management models help reduce environmental impacts while also generating economic opportunities. The positive impact of SORM on environmental performance in this study highlights the importance of adopting sustainable practices in managing resources throughout the lifecycle of construction projects. By focusing on sustainability in resource management, construction projects can reduce waste, lower carbon emissions, and create more environmentally-friendly outcomes.

5.1. Conclusion

In addition, Social responsibility has emerged as a critical factor in enhancing the environmental performance of affordable housing projects in Nairobi County. The incorporation of social responsibility practices, such as community engagement and addressing environmental concerns, contributes to more sustainable project outcomes. By aligning housing projects with the broader social and environmental goals, developers can mitigate adverse impacts and create value for both the community and the environment.

Sustainability-oriented resource management processes also play a fundamental role in boosting the environmental performance of affordable housing in Nairobi County. Efficient resource management, including waste reduction, energy conservation, and the use of sustainable materials, significantly impacts the environmental footprint of housing construction. By implementing effective resource management strategies, projects can achieve long-term sustainability and minimize their environmental impact.

6.1. Recommendations

Social responsibility practices should be made a central aspect of housing projects. Developers should integrate corporate social responsibility (CSR) into their project strategies by prioritizing community development, environmental conservation, and adherence to ethical practices. Emphasizing social responsibility will not only improve environmental outcomes but also build stronger relationships with the local communities, ensuring long-term project sustainability and positive social impact.

Sustainability-oriented resource management should be embedded as a core practice in all stages of housing construction. Project managers should focus on efficient use of resources, including water, energy, and materials, and adopt waste reduction and recycling strategies. Additionally, the integration of green technologies and renewable energy sources should be encouraged to reduce the environmental footprint of construction projects. Regulatory frameworks should support these practices by providing incentives for sustainable resource management and enforcing environmental standards.

6.2. Further Research Recommendations

This study has offered valuable insights into the impact of sustainable project management practices on the environmental performance of affordable housing construction projects in Nairobi County, with a focus on four key practices: Stakeholder's engagement, Social responsibility, Sustainability-oriented resource management, and Staff training. While these practices were found to have a significant influence, there is a need for future research to explore additional sustainable project management practices. For instance, examining the impact of technological innovations in construction, green procurement practices, or the role of leadership in fostering sustainability could provide a more comprehensive understanding of the factors contributing to environmental performance in housing projects.

Moreover, this study was geographically limited to Nairobi County, which, while offering a detailed and localized perspective, may restrict the generalizability of the results to other counties or regions. As such, future studies should consider replicating or expanding this research to include affordable housing projects in other counties within Kenya or even in different countries. This would allow for a more diverse sample and help determine whether the relationships observed in this study hold true in varying contexts. Expanding the research scope could also improve the applicability of the findings to broader settings and help policymakers and industry practitioners make informed decisions that are relevant across different geographic areas..

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